Alaskan Way Viaduct and Seawall Replacement Project

AWV No Replacement Concept

Summary Findings

September 17, 2004

This memorandum summarizes investigation of a concept for the Alaskan Way Viaduct (AWV) that does not fully replace the current capacity of the corridor, but instead looks at the potential to maintain accessibility through other means.

The concept studied considers a configuration that provides multiple connections from the SR 99 corridor to the downtown street grid, limits surface Alaskan Way on the central waterfront to four travel lanes, and provides connections from Alaskan Way to the Battery Street Tunnel (one lane each direction) and to the Elliott Avenue/Western Avenue couplet (one lane each direction). A second lane in each direction through the BST provides local access in the Belltown area by connecting to Western Avenue near the existing Battery Street ramps.

Improvements elsewhere in the transportation system are investigated in conjunction with the No Replacement concept to understand how they could influence travel patterns, and whether they can help maintain accessibility and mobility. In particular, improved connections between SR 99 and the downtown street grid, additional connections and operational revisions to the street grid, operational revisions to I-5 (excluding major capacity expansion), and transit priority improvements were evaluated. Potential for demand management is also looked at qualitatively.

Key Findings

- Not replacing the viaduct would result in severe congestion on downtown streets, I-5, and Alaskan Way from early morning until late evening, even with optimistic assumptions about shifting traffic to other routes, increasing transit ridership, and managing travel demand. The transportation system is already capacity constrained, and will become more so as the region continues to grow.

- The AWV is an essential transportation corridor. It provides access to downtown and, along with I-5, is the primary corridor for trips through downtown. It is depended upon by commuters, freight haulers, commercial users, and other travelers to access downtown, Seattle's neighborhoods, and neighboring communities.

- Good alternative routes do not exist for most AWV users, including freight trips. A majority of trips on the AWV – about 70% – are passing through the downtown area. The downtown street grid is designed and intended to accommodate local access, not longer distance trips through the city. I-5 and connecting streets do not have sufficient

capacity to effectively accommodate AWV traffic, which is a limitation that cannot be solved by the improvements identified in this study.

- A No Replacement concept would result in a less desirable waterfront than today. Without the AWV available to carry trips through the downtown, traffic on surface Alaskan Way would quadruple along the central waterfront; 35,000 to 56,000 vehicles per day would drive on sections of Alaskan Way compared to about 10,000 today.

- The accessibility to Seattle's neighborhoods would be reduced by degraded traffic conditions downtown. Trips on the western side of the city (e.g. – Ballard, West Seattle, Queen Anne) would be especially impacted, with people avoiding travel through downtown due to the increased length of the trip and worsened traffic conditions.

- Center City Access Strategies (CCAS), expanded and improved transit services, and demand management programs are potentially important tools to help accommodate sustainable growth. Improvements such as these are needed in addition to existing transportation system components such as the AWV, not in lieu of them.

Summary Results

System Characteristics

An understanding of the existing and future forecasted transportation system conditions and characteristics provides context for findings specific to the analysis of the No Replacement concept. The conditions described in this section apply to the current and planned transportation system; i.e. – the AWV corridor is maintained.

Geography and the Transportation System

- Seattle's north-south development pattern is responsible for a concentration of travel through the downtown area. Two primary travel corridors, I-5 and SR 99, connect outlying areas not only to downtown, but also provide access between neighborhoods and communities on opposite sides of downtown.

Streets and Highways

- SR 99 and the downtown street grid currently operate under congested conditions during peak commuting periods, while I-5 is congested throughout much of the day. The magnitude and duration of congestion on these facilities will increase as the region's population and commercial activity continues to grow.

- The AWV carries up to 110,000 vehicles per weekday, roughly 20% to 25% of the total traffic traveling north-south in downtown Seattle (including downtown streets and I-5). Traffic volumes on the AWV are expected to grow to 137,000 vehicles per day in the year 2030 due to increased population and commercial activity.

- Approximately 70% of trips on the AWV are traveling completely through downtown, rather than to destinations in the downtown area. Both trips between Seattle neighborhoods and trips between Seattle and its neighboring cities comprise the vast majority of these trips.

- I-5 currently operates under congested conditions for five or more hours during a typical weekday. As Seattle's and the region's population continues to increase, demand for travel on I-5 will also increase. Lack of available capacity will constrain the ability for I-5 to accommodate the demand projected, leading to extreme peak spreading (congested conditions throughout the day) and inability to accommodate increased demand.

- Traffic on downtown streets is anticipated to remain at today's levels if the AWV capacity is retained and the very high levels of predicted transit ridership (and supportive demand reduction methods and strategies) can be achieved. A larger share of the capacity of the downtown street grid will be needed for transit uses in the future, which will increase person-carrying capacity and help maintain mobility for people traveling in downtown, but will reduce the capacity available to accommodate additional vehicle trips.

Transit Services

- Analysis of future conditions predicts very high growth in transit ridership, reflecting an increasing reliance on transit services to maintain mobility (particularly in the downtown area). Commute trips to downtown on transit are expected to more than double, with 77% of workers in downtown commuting by transit in the year 2030. Transit is forecast to carry 21% of trips overall in Seattle by 2030, which would result in ridership levels more than two and one-half times higher than today. Even with this very high level of transit use, traffic will continue to increase as the region's population and commercial activity grows. Vehicle trips on I-5 and SR 99 are expected to increase 25% to 30% by 2030.

Freight Trips

- The AWV serves the Duwamish and Ballard/Interbay (BINMIC) industrial areas, and carries approximately 4,000 to 5,000 medium and heavy-duty trucks per day (20% of freight traveling through downtown Seattle).

- I-5 and SR 99 are the primary trucking routes through downtown. The downtown street grid is not well suited to accommodate a large number of trucks, and is currently used primary to accommodate oversized loads, local deliveries, and transport of materials prohibited on either SR 99 or I-5.

No Replacement Concept Findings

These findings describe anticipated conditions under the No Replacement concept. The results are specific to forecast conditions for the year 2030 unless otherwise noted.

Traffic Impacts

Under a No Replacement concept, trips from the AWV corridor would divert to other facilities;

- Surface Alaskan Way would carry a fourfold increase in traffic along the central waterfront; between 35,000 and 56,000 vehicles per day depending on location (compared to about 10,000 to 15,000 vehicles per day with the AWV in place). Heavy traffic congestion would be experienced all day.

- Traffic downtown and in Pioneer Square would increase 30% to 50%. The downtown street grid would not have sufficient capacity to accommodate the additional demand during peak periods, and highly congested conditions would be expected for much of the day. Accessibility to downtown would be reduced, particularly for commercial and other vehicle-dependant types of trips.

- Demand on I-5 is forecast to increase by 24,000 to 33,000 vehicles per day, a 7% to 10% increase over forecast conditions with the AWV in place. This impact is in addition to a nearly 70,000 vehicle increase that is predicted due to population and commercial growth in the region by 2030. With this level of demand, severe congestion would occur all day, as capacity constraints would restrict throughput on the corridor. Even with significant shifting of trips to "off-peak" time periods, I-5 would not have sufficient capacity to accommodate the forecasted demand without very costly expansion to add additional lanes.

- Accessibility to downtown and between Seattle's neighborhoods would be reduced for trips that pass through the downtown area. 38,000 fewer north-south trips (equivalent to 28% of AWV trips) in the downtown area are forecast. Origin-destination analysis indicates that a greater share of through trips will be affected than trips to downtown. In many cases, as many as 25% of trips between locations south of downtown (West Seattle, the Duwamish area, and areas around SeaTac) and locations north of downtown (Ballard, Queen Anne, South Lake Union, Magnolia, and Greenlake) would not be accommodated without the AWV.

Transportation System Improvements

This study considered the potential for improvements elsewhere in the transportation system, including Seattle's Center City Access Strategy (CCAS) program, to replace the access and mobility currently provided by the AWV. A number of the concepts reviewed merit further consideration as means of maintaining accessibility and mobility and, in particular, providing for sustainable growth within the city. However, these projects would not offset the impacts of reducing capacity on the AWV corridor, and the effectiveness of some strategies would likely be reduced under such circumstances.

I-5 Improvements

- Even with the AWV in place, I-5 capacity is severely restricted relative to the forecasted demand. Improvements to I-5 are necessary to address existing and forecast deficiencies, and would not help accommodate even greater demand.

- This study considered location-specific improvements to address operational deficiencies on I-5, but did not assess major expansion of I-5 (additional lanes) to increase capacity. Potential improvements identified include reconfiguration of the northbound I-5 ramps at Spokane Street and I-90 to reduce weaving conflicts, consolidation of off-ramps from northbound I-5 to downtown, extension of a third through lane on northbound I-5, and increasing access between the mainline and express lanes. These projects appear to have potential to improve existing operational deficiencies, which would benefit specific traffic movements. The overall benefits to corridor throughput are modest however, as the improvements would only address some of the bottlenecks on the corridor and would not significantly expand capacity.

- Expansion of I-405 and other regional facilities was not considered in this analysis. Prior analysis of the effects of I-405 and other regional capacity expansions on traffic conditions in the downtown area showed modest reduction in traffic on I-5 and downtown streets (3% or less), but not a significant change in the overall operating conditions (duration and severity of congestion). Capacity expansion on I-405 would only offset a fraction of the growth in trips forecast on I-5 by 2030, let alone the additional demand that would result from reduced capacity on the AWV corridor.

Improvements to the Arterial Street System

- The CCAS strategies that have been identified to date show a number of potential benefits, including the ability to help improve transit operations, provision of additional connections within the grid system, and local operational improvements. Further study of project elements merits consideration.

- The intent behind some of the CCAS strategies is to make better use of available existing capacity within the transportation system. With the No Replacement concept, traffic shifted to I-5 and the available street grid would overwhelm the capacity of these facilities, reducing the effectiveness of these kinds of CCAS strategies.

- The CCAS strategies do not increase the capacity of the downtown street grid, and do not enable downtown streets to accommodate the increased volumes that would be expected if the AWV were not replaced.

- Many of the CCAS projects reserve existing street capacity to maintain or improve bus mobility in, and accessibility to, downtown. Under the right conditions, these projects can increase the person-carrying capacity of downtown streets, but would reduce the vehicle carrying capacity. A replacement project that reduces capacity on the AWV corridor would shift vehicle trips to downtown streets, which would have less capacity available to accommodate vehicle trips.

Transit and Travel Demand Management

- Modeling for year 2030 conditions forecasts substantial increases in transit ridership, as described in the previous section. While travel demand modeling specifically predicts only auto and transit trips, the transit growth projected encompasses the total traffic reduction benefits that could reasonably be achieved by the combined implementation of expanded transit services and aggressive travel demand management strategies.

- Maximizing the use of transit services and more effective demand management strategies will be necessary to help keep pace with regional growth. These programs cannot offset the impacts of removing the existing AWV capacity from the transportation network, nor can they replace all of the existing functions of the corridor.

- Road pricing strategies were not specifically examined in this analysis. By increasing the marginal cost of travel, road pricing can lower travel demand by causing some trips to shift modes, change destinations, alter time of travel, or be eliminated altogether. For pricing to effectively manage demand within a congested network of freeways and arterials — especially under a reduced capacity scenario — it would need widespread implementation. Such a region-wide pricing scheme would require agreement and coordination between a number of agencies and jurisdictions, time for emerging toll collection technologies to mature, as well as enabling legislation, which in itself would require a certain measure of public support.

- Many of the potential benefits of road pricing are not likely to change conditions from those presented in this analysis. Opportunities for additional mode shift from auto to other modes - beyond that already predicted in the analysis - are limited. The transit ridership projections inherent in the 2030 analysis likely capture most of the potential transit market for trips in the study area. Additionally, opportunities for shifting trips to off-peak hours is likely limited, as I-5 is expected to operate under peak period conditions for most of the day by the year 2030. As such, the primary impacts of broader network road pricing strategies would likely be reflected as some reduction in trip making and/or diversion of trips to other locations, but not to a significant degree as to mitigate congestion in the greater downtown area.